

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of

Date: May 15, 2008

Applicants: Bednorz et al.

Docket: YO987-074BZ

Serial No.: 08/479,810

Group Art Unit: 1751

Filed: June 7, 1995

Examiner: M. Kopec

For: NEW SUPERCONDUCTIVE COMPOUNDS HAVING HIGH TRANSITION  
TEMPERATURE, METHODS FOR THEIR USE AND PREPARATION

Commissioner for Patents  
United States Patent and Trademark Office  
P.O. Box 1450  
Alexandria, VA 22313-1450

**CORRECTED APPEAL BRIEF**

**Part VII**

**CFR 37 §41.37(c)(1)(vii)**

**VOLUME 3**

**Part 6**

**Argument For the Patentability of Each Rejected Claims 358-443**

Respectfully submitted,

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### **CLAIM 358**

Claim 358 which is allowed recites:

CLAIM 358 An apparatus according to anyone of claims 186 or 221, wherein said superconductive oxide composition can be made according to known principles of ceramic science.

## CLAIM 359/195

CLAIM 359/195 recites:

CLAIM 195 An apparatus comprising a current source flowing a superconducting electrical current in a copper oxide composition of matter comprising a  $T_c$  greater than or equal to 26°K and a temperature controller maintaining said copper oxide composition of matter at a temperature less than said  $T_c$ .

CLAIM 359 An apparatus according to anyone of claims 195 or 230, wherein said copper oxide composition can be made according to known principles of ceramic science.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

The sentenced bridging page 1 and 2 of the specification states

“Generally, superconductivity is considered to be a property of the metallic state of a material since all known superconductors are metallic under the conditions that cause them to be superconducting. A few normally non-metallic materials, for example, become superconducting under very high pressure wherein the pressure converts them to metals before they exhibit superconducting behavior.” Applicants discovered that ceramic materials are superconductors.

## CLAIM 359/230

CLAIM 359/230 recites:

CLAIM 195 An apparatus comprising a current source flowing a superconducting electrical current in a copper oxide composition of matter comprising a  $T_c$  greater than or equal to 26°K and a temperature controller maintaining said copper oxide composition of matter at a temperature less than said  $T_c$ .

CLAIM 230 An apparatus according to claim 195 wherein said copper oxide composition comprises substantially layered perovskite crystal structure.

CLAIM 359 An apparatus according to anyone of claims 195 or 230, wherein said copper oxide composition can be made according to known principles of ceramic science.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe,

Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

The sentenced bridging page 1 and 2 of the specification states

"Generally, superconductivity is considered to be a property of the metallic state of a material since all known superconductors are metallic under the conditions that cause them to be superconducting. A few normally non-metallic materials, for example, become superconducting under very high pressure wherein the pressure converts them to metals before they exhibit superconducting behavior." Applicants discovered that ceramic materials are superconductors.

## CLAIM 360/286

CLAIM 360/286 recites:

CLAIM 286 An apparatus comprising a source of a superconducting electrical current in a copper oxide composition of matter comprising a  $T_c$  greater than or equal to 26°K and a temperature controller for maintaining said copper oxide composition of matter at a temperature less than said  $T_c$ .

CLAIM 360 An apparatus according to anyone of claims 286 or 321, wherein said copper oxide composition can be made according to known principles of ceramic science.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

The sentenced bridging page 1 and 2 of the specification states

“Generally, superconductivity is considered to be a property of the metallic state of a material since all known superconductors are metallic under the conditions that cause them to be superconducting. A few normally non-metallic materials, for example, become superconducting under very high pressure wherein the pressure converts them to metals before they exhibit superconducting behavior.” Applicants discovered that ceramic materials are superconductors.



## CLAIM 360/321

CLAIM 360/321 recites:

CLAIM 286 An apparatus comprising a source of a superconducting electrical current in a copper oxide composition of matter comprising a Tc greater than or equal to 26°K and a temperature controller for maintaining said copper oxide composition of matter at a temperature less than said Tc.

CLAIM 321 An apparatus according to claim 286 wherein said copper oxide composition comprises substantially layered perovskite crystal structure.

CLAIM 360 An apparatus according to anyone of claims 286 or 321, wherein said copper oxide composition can be made according to known principles of ceramic science.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe,

Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

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"Generally, superconductivity is considered to be a property of the metallic state of a material since all known superconductors are metallic under the conditions that cause them to be superconducting. A few normally non-metallic materials, for example, become superconducting under very high pressure wherein the pressure converts them to metals before they exhibit superconducting behavior." Applicants discovered that ceramic materials are superconductors.

### CLAIM 361

CLAIM recites:

CLAIM 361 A superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, the composition including a rare earth or an element comprising a rare earth characteristic, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, means for maintaining said composition at said temperature to exhibit said superconductivity and means for passing an electrical superconducting current through said composition while exhibiting said superconductivity.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in

view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 362

CLAIM 362 recites:

CLAIM 361 A superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, the composition including a rare earth or an element comprising a rare earth characteristic, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, means for maintaining said composition at said temperature to exhibit said superconductivity and means for passing an electrical superconducting current through said composition while exhibiting said superconductivity.

CLAIM 362 The superconducting apparatus of claim 361, further including an alkaline earth element substituted for at least one atom of said rare earth or element comprising a rare earth characteristic in said composition.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole

1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

### CLAIM 363

CLAIM 363 recites:

CLAIM 361 A superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, the composition including a rare earth or an element comprising a rare earth characteristic, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, means for maintaining said composition at said temperature to exhibit said superconductivity and means for passing an electrical superconducting current through said composition while exhibiting said superconductivity.

CLAIM 362 The superconducting apparatus of claim 361, further including an alkaline earth element substituted for at least one atom of said rare earth or element comprising a rare earth characteristic in said composition.

CLAIM 363 The superconducting apparatus of claim 362, where said rare earth or element comprising a rare earth characteristic is selected from the group consisting of La, Nd, and Ce.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that

come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.



## CLAIM 364

CLAIM 364 recites:

CLAIM 361 A superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, the composition including a rare earth or an element comprising a rare earth characteristic, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, means for maintaining said composition at said temperature to exhibit said superconductivity and means for passing an electrical superconducting current through said composition while exhibiting said superconductivity.

CLAIM 364 The superconducting apparatus of claim 361, where said phase is crystalline with a structure comprising a perovskite characteristic.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement

Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, News and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 365

CLAIM 365 recites:

CLAIM 361 A superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, the composition including a rare earth or an element comprising a rare earth characteristic, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, means for maintaining said composition at said temperature to exhibit said superconductivity and means for passing an electrical superconducting current through said composition while exhibiting said superconductivity.

CLAIM 362 The superconducting apparatus of claim 361, further including an alkaline earth element substituted for at least one atom of said rare earth or element comprising a rare earth characteristic in said composition.

CLAIM 365 The superconducting apparatus of claim 362, where said phase is crystalline with a structure comprising a perovskite characteristic.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has

expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 366

CLAIM 366 recites:

CLAIM 361 A superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, the composition including a rare earth or an element comprising a rare earth characteristic, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, means for maintaining said composition at said temperature to exhibit said superconductivity and means for passing an electrical superconducting current through said composition while exhibiting said superconductivity.

CLAIM 366 The superconducting apparatus of claim 361, where said phase exhibits a crystalline structure comprising a layered characteristic.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement

Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, News and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 367

CLAIM 367 recites:

CLAIM 12 A superconducting combination, comprising a superconductive oxide having a transition temperature greater than or equal to 26°K,

A current source for passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said transition temperature, and

a temperature controller for cooling said composition to a superconducting state at a temperature greater than or equal to 26°K.

CLAIM 15 The combination of claim 12, where said superconductive composition includes a multivalent transition metal, oxygen, and at least one additional element.

CLAIM 367 The combination of claim 15, where said additional element is a rare earth or an element comprising a rare earth characteristic.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has

expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.



## CLAIM 368

CLAIM 368 recites:

CLAIM 12 A superconducting combination, comprising a superconductive oxide having a transition temperature greater than or equal to 26°K,

A current source for passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said transition temperature, and

a temperature controller for cooling said composition to a superconducting state at a temperature greater than or equal to 26°K.

CLAIM 368 The combination of claim 12, where said composition includes a superconducting phase comprising a perovskite characteristic.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole

1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 369

CLAIM 369 recites:

CLAIM 12 A superconducting combination, comprising a superconductive oxide having a transition temperature greater than or equal to 26°K,

A current source for passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said transition temperature, and

a temperature controller for cooling said composition to a superconducting state at a temperature greater than or equal to 26°K.

CLAIM 20 The combination of claim 12, where said composition includes a substituted transition metal oxide.

CLAIM 369 The combination of claim 20, where said substituted transition metal oxide has a structure comprising a layered characteristic.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that

persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 370

CLAIM 370 recites:

CLAIM 27 A superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, said composition being a substituted Cu-oxide including a superconducting phase having a structure which is structurally substantially similar to the orthorhombic-tetragonal phase of said composition, means for maintaining said composition at a temperature greater than or equal to said transition temperature to put said composition in a superconducting state; and means for passing current through said composition while in said superconducting state.

CLAIM 31 The superconducting apparatus of claim 27, where said composition has a crystalline structure which enhances electron-phonon interactions to produce superconductivity at a temperature greater than or equal to 26°K.

CLAIM 370 The superconducting apparatus of claim 31, where said crystalline structure comprises a layered characteristic, enhancing the number of Jahn-Teller polarons in said composite.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has

given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 371

CLAIM 371 recites:

CLAIM 48 A superconductive apparatus comprising a superconductive composition comprised of a transition metal oxide having substitutions therein, the amount of said substitutions being sufficient to produce sufficient electron-phonon interactions in said composition that said composition exhibits a superconducting onset at temperatures greater than or equal to 26°K, and a source of current for passing a superconducting electric current through said superconductor.

CLAIM 371 The superconductive apparatus of claim 48, where said substitutions include a rare earth or an element comprising a rare earth characteristic.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner

has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.



## CLAIM 372

CLAIM 372 recites:

CLAIM 372 A superconductive apparatus comprised of a copper oxide comprising a crystalline structure comprising a layered characteristic and at least one additional element substituted in said crystalline structure, said structure being oxygen deficient and exhibiting a superconducting onset temperature greater than or equal to 26°K.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

### CLAIM 373

CLAIM 373 recites:

CLAIM 373 A combination, comprised of:

a copper oxide superconductor having a superconductor onset temperature greater than about 26°K including an element which results in a mixed valent state in said oxide, said oxide being crystalline and comprising a structure comprising a layered characteristic,

means for passing a superconducting current through said copper oxide while it is maintained at a temperature greater than or equal to 26°K and less than said superconducting onset temperature, and

means for cooling said copper oxide to a superconductive state at a temperature greater than or equal to 26°K and less than said superconducting onset temperature.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole

1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

### CLAIM 374

CLAIM 374 recites:

CLAIM 374 A combination, comprised of:

a material comprising a ceramic characteristic comprising an onset of superconductivity at an onset temperature greater than or equal to 26°K,

means for passing a superconducting electrical current through said material comprising a ceramic characteristic while said material is maintained at a temperature greater than or equal to 26°K and less than said onset temperature, and

means for cooling said superconducting material having a ceramic characteristic to a superconductive state at a temperature greater than or equal to 26°K and less than said onset temperature, said material being superconductive at temperatures below said onset temperature and a ceramic at temperatures above said onset temperature.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim

without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

### **CLAIM 375**

Claim 375 which is allowed recites:

CLAIM 375 An apparatus comprising a composition exhibiting superconductivity at temperatures greater than or equal to 26°K, said composition being a material comprising a ceramic characteristic in the RE-AE-TM-O system, where RE is a rare earth or near rare earth element, AE is an alkaline earth element, TM is a multivalent transition metal element having at least two valence states in said composition, and O is oxygen, the ratio of the amounts of said transition metal in said two valence states being determined by the ratio RE : AE, a source of current for passing a superconducting electric current in said transition metal oxide, and a cooling apparatus for maintaining said transition metal oxide below said onset temperature and at a temperature greater than or equal to 26°K.

## CLAIM 376

CLAIM 376 recites:

CLAIM 69 A superconductive combination, comprising:

a superconducting composition exhibiting a superconducting transition temperature greater than or equal to 26°K, said composition being a transition metal oxide having a distorted orthorhombic crystalline structure, and

means for passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said superconducting transition temperature.

CLAIM 70 The combination of claim 69, where said transition metal oxide is a mixed copper oxide.

CLAIM 71 The combination of claim 70, where said mixed copper oxide includes an alkaline earth element.

CLAIM 376 The combination of claim 71, where said mixed copper oxide further includes a rare earth or an element comprising a rare earth characteristic.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that

come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.



**CLAIM 377**

Claim 377 is withdrawn.

**CLAIM 378**

Claim 378 is withdrawn.

## CLAIM 379

CLAIM 379 which is allowed recites:

CLAIM 379 A combination, comprising:

a mixed copper oxide composition including an alkaline earth element (AE) and a rare earth or element (RE) comprising a rare earth characteristic, said composition comprising a crystalline structure comprising a layered characteristic and multi-valent oxidation states, said composition exhibiting a substantially zero resistance to the flow of electrical current therethrough when cooled to a superconducting state at a temperature greater than or equal to 26°K, said mixed copper oxide having a superconducting onset temperature greater than or equal to 26°K, and

a current source for passing an electrical superconducting current through said composition when said composition exhibits substantially zero resistance at a temperature greater than or equal to 26°K and less than said onset temperature.

## **CLAIM 380**

CLAIM 380 which is allowed recites:

CLAIM 380 The combination of claim 379, wherein said crystalline structure comprises a perovskite characteristic.

### CLAIM 381

Claim 381 which is allowed recites:

CLAIM 381 An apparatus comprising a superconductor having a superconducting onset temperature greater than or equal to 26°K, said superconductor being comprised of a rare earth or an element (RE) comprising a rare earth characteristic, an alkaline earth element (AE), a transition metal element (TM), and Oxygen (O) and having the general formula RE-AE-TM-O, said superconductor being made by a method comprising the steps of combining said rare earth or element comprising a rare earth characteristic, said alkaline earth element and said transition metal element in the presence of oxygen to produce a mixed transition metal oxide including said rare earth or element comprising a rare earth characteristic and said alkaline earth element therein, and

heating said mixed transition metal oxide to produce superconductor having a crystalline structure comprising a layered characteristic and exhibiting a superconducting onset temperature greater than or equal to 26°K, said superconductor having a non-stoichiometric amount of oxygen therein.

## CLAIM 382

CLAIM 382 recites:

CLAIM 93 An apparatus, comprising:

a mixed copper oxide material exhibiting an onset of superconductivity at an onset temperature greater than or equal to 26°K, and

a current source for producing an electrical current through said copper oxide material while it is in a superconducting state at a temperature greater than or equal to 26°K.

CLAIM 382 The apparatus of claim 93, where said copper oxide material exhibits a crystalline structure comprising a layered characteristic.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner

has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

### CLAIM 383

CLAIM 383 recites:

CLAIM 383 A superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

- (a) a superconductor element made of a superconductive composition, the superconductive composition comprising a copper-oxide compound having a crystal structure comprising a perovskite characteristic and a layered characteristic, the composition having a superconductor transition temperature  $T_c$  of greater than or equal to 26°K;
- (b) means controller for maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature  $T_c$  of the superconductive composition; and
- (c) means for causing an electric current to flow in the superconductor element.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim

without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.



#### **CLAIM 384**

Claim 384 which is allowed recites:

CLAIM 384 The superconductive apparatus according to claim 383 in which the copper-oxide compound of the superconductive composition includes at least one rare-earth or element comprising a rare earth characteristic and at least one alkaline-earth element.

#### **CLAIM 385**

Claim 385 which is allowed recites:

CLAIM 385 The superconductive apparatus according to claim 384 in which the rare-earth or element comprising a rare earth characteristic is lanthanum.

#### **CLAIM 386**

Claim 386 which is allowed recites:

CLAIM 386 A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal

structure comprising a layered characteristic and a perovskite characteristic, the copper-oxide compound including at least one rare-earth or element comprising a rare earth characteristic and at least one alkaline-earth element, the composition having a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature  $T_c$  and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature  $T_{q=0}$ , the transition-onset temperature  $T_c$  being greater than or equal to 26°K;

(b) a temperature controller for maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature  $T_{q=0}$  of the superconductive composition; and

(c) a current source for causing an electric current to flow in the superconductor element.

### **CLAIM 387**

Claim 387 which is allowed recites:

CLAIM 387 The superconductive apparatus according to claim 386 in which the rare-earth or an element comprising a rare earth characteristic is lanthanum.

### **CLAIM 388**

Claim 388 which is allowed recites:

CLAIM 388 An apparatus comprising:

a composition including a transition metal, a rare earth or an element comprising a rare earth characteristic, an alkaline earth element, and oxygen, where said composition is a mixed transition metal oxide having a non-stoichiometric amount of oxygen therein and exhibiting a superconducting state at a temperature greater than or equal to 26°K,

a temperature controller maintaining said composition in said superconducting state at a temperature greater than or equal to 26°K, and

a current source passing an electrical current through said composition while said composition is in said superconducting state.

## CLAIM 389

CLAIM 389 recites:

CLAIM 389 A superconductive apparatus for causing electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

- (a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the composition having a superconductor transition temperature  $T_c$  of greater than or equal to 26°K;
- (b) a temperature controller maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature  $T_c$  of the superconductive composition; and
- (c) causing an electric current to flow in the superconductor element.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that

persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

### **CLAIM 390**

Claim 390 which is allowed recites:

CLAIM 390 The superconductive apparatus according to claim 389 in which the copper-oxide compound of the superconductive composition includes at least one rare-earth or an element comprising a rare earth characteristic and at least one alkaline-earth element.

### **CLAIM 391**

Claim 391 which is allowed recites:

CLAIM 391 The superconductive apparatus according to claim 390 in which the rare-earth or an element comprising a rare earth characteristic is lanthanum.

### **CLAIM 392**

Claim 392 which is allowed recites:

CLAIM 392 A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal

structure comprising a layered characteristic and a perovskite characteristic, the copper-oxide compound including at least one rare-earth or rare-earth-like element and at least one alkaline-earth element, the composition having a superconductive/resistive-transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature  $T_c$  and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature  $T_p=0$ , the transition-onset temperature  $T_c$  being greater than or equal to 26°K;

(b) a temperature controller maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature  $T_p=0$  of the superconductive composition; and

(c) a current source causing an electric current to flow in the superconductor element.

### **CLAIM 393**

Claim 393 which is allowed recites:

CLAIM 393 The superconductive apparatus according to claim 392 in which the rare-earth or an element comprising a rare earth characteristic is lanthanum.

## CLAIM 394

CLAIM 394 recites:

CLAIM 394 An apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the composition having a superconductive transition temperature  $T_c$  of greater than or equal to 26°K, said superconductive composition includes at least one element selected from the group consisting of a Group II A element, a rare earth element; and a Group III B element;

(b) a temperature controller maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature  $T_c$  of the superconductive composition; and

(c) a current source causing an electric current to flow in the superconductor element.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on



Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 395

CLAIM 395 recites:

CLAIM 395 An apparatus for conducting an electric current essentially without resistive losses, comprising:

- (a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the copper-oxide compound including at least one element selected from the group consisting of a Group II A element, a rare earth element and a Group III B element, the composition having a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature  $T_c$  and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature  $T_{p=0}$ , the transition-onset temperature  $T_c$  being greater than or equal to 26°K;
- (b) a temperature controller maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature  $T_{p=0}$  of the superconductive composition; and
- (c) a current source causing an electric current to flow in the superconductor element.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

### CLAIM 396

Claim 396 which is allowed recites:

CLAIM 396 A superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the composition having a superconductive transition temperature  $T_c$  of greater than or equal to 26°K, said superconductive composition includes at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element;

(b) a temperature controller maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature  $T_c$  of the superconductive composition; and

(c) a current source causing an electric current to flow in the superconductor element.

### CLAIM 397

Claim 397 which is allowed recites:

CLAIM 397 A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the copper-oxide compound including at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element, the composition having a superconductive/resistive transition defining a superconductive-resistive-transition temperature range between an upper limit defined by a transition-onset temperature  $T_c$  and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature  $T_{p=0}$ , the transition-onset temperature  $T_c$  being greater than or equal to 26°K;

(b) a temperature controller maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature  $T_{p=0}$  of the superconductive composition; and

(c) a current source causing an electric current to flow in the superconductor element.

### **CLAIM 398**

Claim 398 which is allowed recites:

CLAIM 398 A superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a transition metal oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the composition having a superconductive transition temperature  $T_c$  of greater than or equal to 26°K, said superconductive composition includes an element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element;

(b) a temperature controller maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition  $T_c$  of the superconductive composition; and

(c) a current source causing an electric current to flow in the superconductor element.

### **CLAIM 399**

Claim 399 which is allowed recites:

CLAIM 399 A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a transition metal-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the transition metal-oxide compound including at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element, the composition having a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature  $T_c$  and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature  $T_p=0$ , the transition-onset temperature  $T_c$  being greater than or equal to 26°K;

(b) a temperature controller maintaining the superconductor element at a temperature below the effectively-zero-bulk-

resistivity intercept temperature  $T_p=0$  of the superconductive composition; and

(c) a current source causing an electric current to flow in the superconductor element.

#### **CLAIM 400**

Claim 400 which is allowed recites:

CLAIM 400 A superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the composition having a superconductive transition temperature  $T_c$  of greater than or equal to 26°K, said superconductive composition includes a Group II A element, and at least one element selected from the group consisting of a rare earth element and a Group III B element;

(b) a temperature controller maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature  $T_c$  of the superconductive composition; and



(c) a current source causing an electric current to flow in the superconductor element.

#### **CLAIM 401**

Claim 401 which is allowed recites:

CLAIM 401 A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the copper-oxide compound including Group II A element, and at least one element selected from the group consisting of a rare earth element and a Group III B element, the composition having a superconductive-resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature  $T_c$  and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature  $T_p=0$ , the transition-onset temperature  $T_c$  being greater than or equal to 26°K;

(b) a temperature controller maintaining the superconductor element at a temperature below the effectively-zero-bulk-

resistivity intercept temperature  $T_p=0$  of the superconductive composition; and

(c) a current source causing an electric current to flow in the superconductor element.

## CLAIM 402

CLAIM 402 recites:

CLAIM 402 An apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

- (a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the composition comprising a superconductor transition temperature  $T_c$  of greater than or equal to 26°K;
- (b) a temperature controller for maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature  $T_c$  of the superconductive composition; and
- (c) a source of an electric current to flow in the superconductor element.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that

persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

### **CLAIM 403**

Claim 403 which is allowed recites:

CLAIM 403 An apparatus according to claim 402 in which the copper-oxide compound of the superconductive composition includes at least one rare-earth or an element comprising a rare earth characteristic and at least one alkaline-earth element.

### **CLAIM 404**

Claim 404 which is allowed recites:

CLAIM 404 An apparatus according to claim 403 in which the rare-earth or element comprising a rare earth characteristic is lanthanum.

### **CLAIM 405**

Claim 405 which is allowed recites:

CLAIM 405 An apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a layer-type perovskite-like crystal structure, the copper-oxide

compound comprising at least one rare-earth or element comprising a rare earth characteristic and at least one alkaline-earth element, the composition comprising a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature  $T_c$  and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature  $T_p=0$ , the transition-onset temperature  $T_c$  being greater than or equal to 26°K;

(b) a temperature controller for maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature  $T_p=0$  of the superconductive composition; and

(c) a source of an electric current to flow in the superconductor element.

#### **CLAIM 406**

Claim 406 which is allowed recites:

CLAIM 406 An apparatus according to claim 405 in which the rare-earth or element comprising a rare earth characteristic is lanthanum.

## CLAIM 407

CLAIM 407 recites:

CLAIM 407 An apparatus capable of carrying an electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the composition comprising a superconductive transition temperature  $T_c$  of greater than or equal to 26°K, said superconductive composition includes at least one element selected from the group consisting of a Group II A element, a rare earth element; and a Group III B element;

(b) a temperature controller for maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature  $T_c$  of the superconductive composition; and

(c) a source of an electric current to flow in the superconductor element.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on

Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.



## CLAIM 408

CLAIM 408 recites:

CLAIM 408 An apparatus capable of carrying an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the copper-oxide compound including at least one element selected from the group consisting of a Group II A element, a rare earth element and a Group III B element, the composition comprising a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature  $T_c$  and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature  $T_p=0$ , the transition-onset temperature  $T_c$  being greater than or equal to 26°K;

(b) a temperature controller for maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature  $T_p=0$  of the superconductive composition; and

(c) a source of an electric current to flow in the superconductor element.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 409

Claim 409 which is allowed recites:

CLAIM 409 An apparatus capable of carrying an electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the composition comprising a superconductive transition temperature  $T_c$  of greater than or equal to 26°K, said superconductive composition includes at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element;

(b) a temperature controller for maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature  $T_c$  of the superconductive composition; and

(c) a source of an electric current to flow in the superconductor element.

## CLAIM 410

Claim 410 which is allowed recites:

CLAIM 410 An apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the copper-oxide compound including at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element, the composition comprising a superconductive/resistive transition defining a superconductive-resistive-transition temperature range between an upper limit defined by a transition-onset temperature  $T_c$  and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature  $T_p=0$ , the transition-onset temperature  $T_c$  being greater than or equal to 26°K;

(b) a temperature controller for maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature  $T_p=0$  of the superconductive composition; and

(c) a source of an electric current to flow in the superconductor element.

## CLAIM 411

Claim 411 which is allowed recites:

CLAIM 411 An apparatus capable of carrying an electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a transition metal oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the composition comprising a superconductive transition temperature  $T_c$  of greater than or equal to 26°K, said superconductive composition includes at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element;

(b) a temperature controller for maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition  $T_c$  of the superconductive composition; and

(c) a source of an electric current to flow in the superconductor element.

## CLAIM 412

Claim 412 which is allowed recites:

CLAIM 412 An apparatus for conducting an electric current essentially without resistive losses, comprising:

- (a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a transition metal-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the transition metal-oxide compound including at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element, the composition comprising a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature  $T_c$  and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature  $T_p=0$ , the transition-onset temperature  $T_c$  being greater than or equal to 26°K;
- (b) a temperature controller for maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature  $T_p=0$  of the superconductive composition; and
- (c) a source of an electric current to flow in the superconductor element.

### CLAIM 413

Claim 413 which is allowed recites:

CLAIM 413 An apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the copper-oxide compound including at least one element selected from the group consisting of a group II A element, at least one element selected from the group consisting of a rare earth element and at least one element selected from the group consisting of a Group III B element, the composition comprising a superconductive-resistive transition temperature defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature  $T_c$  and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature  $T_p=0$ , the transition-onset temperature  $T_c$  being greater than or equal to 26°K;

(b) a temperature controller for maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature  $T_p=0$  of the superconductive composition; and

(c) a source of an electric current to flow in the superconductor element.



## CLAIM 414/361

CLAIM 414/361 recites:

CLAIM 361 A superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, the composition including a rare earth or an element comprising a rare earth characteristic, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, means for maintaining said composition at said temperature to exhibit said superconductivity and means for passing an electrical superconducting current through said composition while exhibiting said superconductivity.

CLAIM 414 A superconducting apparatus according to anyone of claims 361-365 or 366, wherein said composition can be made according to known principles of ceramic science.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole

1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

The sentenced bridging page 1 and 2 of the specification states

"Generally, superconductivity is considered to be a property of the metallic state of a material since all known superconductors are metallic under the conditions that cause them to be superconducting. A few normally non-metallic materials, for example, become superconducting under very high pressure wherein the pressure converts them to metals before they exhibit superconducting behavior." Applicants discovered that ceramic materials are superconductors.

## CLAIM 414/362

CLAIM 414/362 recites:

CLAIM 361 A superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, the composition including a rare earth or an element comprising a rare earth characteristic, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, means for maintaining said composition at said temperature to exhibit said superconductivity and means for passing an electrical superconducting current through said composition while exhibiting said superconductivity.

CLAIM 362 The superconducting apparatus of claim 361, further including an alkaline earth element substituted for at least one atom of said rare earth or element comprising a rare earth characteristic in said composition.

CLAIM 414 A superconducting apparatus according to anyone of claims 361-365 or 366, wherein said composition can be made according to known principles of ceramic science.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that

come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

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"Generally, superconductivity is considered to be a property of the metallic state of a material since all known superconductors are metallic under the conditions that cause them to be superconducting. A few normally non-metallic materials, for example, become superconducting under very high pressure wherein the pressure converts them to metals before they exhibit superconducting behavior." Applicants discovered that ceramic materials are superconductors.

## CLAIM 414/363

CLAIM 414/363 recites:

CLAIM 361 A superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, the composition including a rare earth or an element comprising a rare earth characteristic, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, means for maintaining said composition at said temperature to exhibit said superconductivity and means for passing an electrical superconducting current through said composition while exhibiting said superconductivity.

CLAIM 362 The superconducting apparatus of claim 361, further including an alkaline earth element substituted for at least one atom of said rare earth or element comprising a rare earth characteristic in said composition.

CLAIM 363 The superconducting apparatus of claim 362, where said rare earth or element comprising a rare earth characteristic is selected from the group consisting of La, Nd, and Ce.

CLAIM 414 A superconducting apparatus according to anyone of claims 361-365 or 366, wherein said composition can be made according to known principles of ceramic science.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

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## CLAIM 414/364

CLAIM 414/364 recites:

CLAIM 361 A superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, the composition including a rare earth or an element comprising a rare earth characteristic, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, means for maintaining said composition at said temperature to exhibit said superconductivity and means for passing an electrical superconducting current through said composition while exhibiting said superconductivity.

CLAIM 364 The superconducting apparatus of claim 361, where said phase is crystalline with a structure comprising a perovskite characteristic.

CLAIM 414 A superconducting apparatus according to anyone of claims 361-365 or 366, wherein said composition can be made according to known principles of ceramic science.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has

expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

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## CLAIM 414/365

CLAIM 414/365 recites:

CLAIM 361 A superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, the composition including a rare earth or an element comprising a rare earth characteristic, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, means for maintaining said composition at said temperature to exhibit said superconductivity and means for passing an electrical superconducting current through said composition while exhibiting said superconductivity.

CLAIM 362 The superconducting apparatus of claim 361, further including an alkaline earth element substituted for at least one atom of said rare earth or element comprising a rare earth characteristic in said composition.

CLAIM 365 The superconducting apparatus of claim 362, where said phase is crystalline with a structure comprising a perovskite characteristic.

CLAIM 414 A superconducting apparatus according to anyone of claims 361-365 or 366, wherein said composition can be made according to known principles of ceramic science.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

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## CLAIM 414/366

CLAIM 414/366 recites:

CLAIM 361 A superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, the composition including a rare earth or an element comprising a rare earth characteristic, a transition metal element capable of exhibiting multivalent states and oxygen, including at least one phase that exhibits superconductivity at temperature greater than or equal to 26°K, means for maintaining said composition at said temperature to exhibit said superconductivity and means for passing an electrical superconducting current through said composition while exhibiting said superconductivity.

CLAIM 366 The superconducting apparatus of claim 361, where said phase exhibits a crystalline structure comprising a layered characteristic.

CLAIM 414 A superconducting apparatus according to anyone of claims 361-365 or 366, wherein said composition can be made according to known principles of ceramic science.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has

expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

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## CLAIM 415/367

CLAIM 415/367 recites:

CLAIM 12 A superconducting combination, comprising a superconductive oxide having a transition temperature greater than or equal to 26°K,

A current source for passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said transition temperature, and

a temperature controller for cooling said composition to a superconducting state at a temperature greater than or equal to 26°K.

CLAIM 15 The combination of claim 12, where said superconductive composition includes a multivalent transition metal, oxygen, and at least one additional element.

CLAIM 367 The combination of claim 15, where said additional element is a rare earth or an element comprising a rare earth characteristic.

CLAIM 415 A superconducting combination according to anyone of claims 367, 368 or 369, wherein said composition can be made according to known principles of ceramic science.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

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## CLAIM 415/368

CLAIM 415/368 recites:

CLAIM 12 A superconducting combination, comprising a superconductive oxide having a transition temperature greater than or equal to 26°K,

A current source for passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said transition temperature, and

a temperature controller for cooling said composition to a superconducting state at a temperature greater than or equal to 26°K.

CLAIM 368 The combination of claim 12, where said composition includes a superconducting phase comprising a perovskite characteristic.

CLAIM 415 A superconducting combination according to anyone of claims 367, 368 or 369, wherein said composition can be made according to known principles of ceramic science.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that

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## CLAIM 415/369

CLAIM 415/369 recites:

CLAIM 12 A superconducting combination, comprising a superconductive oxide having a transition temperature greater than or equal to 26°K,

A current source for passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said transition temperature, and

a temperature controller for cooling said composition to a superconducting state at a temperature greater than or equal to 26°K.

CLAIM 20 The combination of claim 12, where said composition includes a substituted transition metal oxide.

CLAIM 369 The combination of claim 20, where said substituted transition metal oxide has a structure comprising a layered characteristic.

CLAIM 415 A superconducting combination according to anyone of claims 367, 368 or 369, wherein said composition can be made according to known principles of ceramic science.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has

given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

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## CLAIM 416/370

CLAIM 416/370 recites:

CLAIM 27 A superconducting apparatus comprising a composition having a transition temperature greater than or equal to 26°K, said composition being a substituted Cu-oxide including a superconducting phase having a structure which is structurally substantially similar to the orthorhombic-tetragonal phase of said composition, means for maintaining said composition at a temperature greater than or equal to said transition temperature to put said composition in a superconducting state; and means for passing current through said composition while in said superconducting state.

CLAIM 31 The superconducting apparatus of claim 27, where said composition has a crystalline structure which enhances electron-phonon interactions to produce superconductivity at a temperature greater than or equal to 26°K.

CLAIM 370 The superconducting apparatus of claim 31, where said crystalline structure comprises a layered characteristic, enhancing the number of Jahn-Teller polarons in said composite.

CLAIM 416 A superconducting apparatus according to anyone of claims 370 or 371, wherein said composition can be made according to known principles of ceramic science.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

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"Generally, superconductivity is considered to be a property of the metallic state of a material since all known superconductors are metallic under the conditions that cause them to be superconducting. A few normally non-metallic materials, for example, become superconducting under very high pressure wherein the pressure converts them to metals before they exhibit superconducting behavior." Applicants discovered that ceramic materials are superconductors.

## CLAIM 416/371

CLAIM 416/371 recites:

CLAIM 48 A superconductive apparatus comprising a superconductive composition comprised of a transition metal oxide having substitutions therein, the amount of said substitutions being sufficient to produce sufficient electron-phonon interactions in said composition that said composition exhibits a superconducting onset at temperatures greater than or equal to 26°K, and a source of current for passing a superconducting electric current through said superconductor.

CLAIM 371 The superconductive apparatus of claim 48, where said substitutions include a rare earth or an element comprising a rare earth characteristic.

CLAIM 416 A superconducting apparatus according to anyone of claims 370 or 371, wherein said composition can be made according to known principles of ceramic science.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the

Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

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"Generally, superconductivity is considered to be a property of the metallic state of a material since all known superconductors are metallic under the conditions that cause them to be superconducting. A few normally non-metallic materials, for example, become superconducting under very high pressure wherein the pressure converts them to metals before they exhibit superconducting behavior." Applicants discovered that ceramic materials are superconductors.

## CLAIM 417

CLAIM 417 recites:

CLAIM 372 A superconductive apparatus comprised of a copper oxide comprising a crystalline structure comprising a layered characteristic and at least one additional element substituted in said crystalline structure, said structure being oxygen deficient and exhibiting a superconducting onset temperature greater than or equal to 26°K.

CLAIM 417 A superconducting apparatus according to claim 372, wherein said copper oxide can be made according to known principles of ceramic science.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

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## CLAIM 418

CLAIM 418 recites:

CLAIM 373 A combination, comprised of:

a copper oxide superconductor having a superconductor onset temperature greater than about 26°K including an element which results in a mixed valent state in said oxide, said oxide being crystalline and comprising a structure comprising a layered characteristic,

means for passing a superconducting current through said copper oxide while it is maintained at a temperature greater than or equal to 26°K and less than said superconducting onset temperature, and

means for cooling said copper oxide to a superconductive state at a temperature greater than or equal to 26°K and less than said superconducting onset temperature.

CLAIM 418 A combination according to claim 373, wherein said copper oxide can be made according to known principles of ceramic science.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has

expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

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## CLAIM 419

CLAIM 419 recites:

CLAIM 374 A combination, comprised of:

a material comprising a ceramic characteristic comprising an onset of superconductivity at an onset temperature greater than or equal to 26°K,

means for passing a superconducting electrical current through said material comprising a ceramic characteristic while said material is maintained at a temperature greater than or equal to 26°K and less than said onset temperature, and

means for cooling said superconducting material having a ceramic characteristic to a superconductive state at a temperature greater than or equal to 26°K and less than said onset temperature, said material being superconductive at temperatures below said onset temperature and a ceramic at temperatures above said onset temperature.

CLAIM 419 A combination according to claim 374, wherein said material can be made by known principles of ceramic science.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on

Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

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## **CLAIM 420**

CLAIM 420 which is allowed recites:

CLAIM 420 A apparatus according to claim 375, wherein said composition can be made by known principles of ceramic science.

## CLAIM 421

CLAIM 421 recites:

CLAIM 69 A superconductive combination, comprising:

a superconducting composition exhibiting a superconducting transition temperature greater than or equal to 26°K, said composition being a transition metal oxide having a distorted orthorhombic crystalline structure, and

means for passing a superconducting electrical current through said composition while said composition is at a temperature greater than or equal to 26°K and less than said superconducting transition temperature.

CLAIM 70 The combination of claim 69, where said transition metal oxide is a mixed copper oxide.

CLAIM 71 The combination of claim 70, where said mixed copper oxide includes an alkaline earth element.

CLAIM 376 The combination of claim 71, where said mixed copper oxide further includes a rare earth or an element comprising a rare earth characteristic.

CLAIM 421 A combination according to claim 376, wherein said mixed copper oxide can be made by known principles of ceramic science.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

The sentenced bridging page 1 and 2 of the specification states

"Generally, superconductivity is considered to be a property of the metallic state of a material since all known superconductors are metallic under the conditions that cause them to be superconducting. A few normally non-metallic materials, for example, become superconducting under very high pressure wherein the pressure converts them to metals before they exhibit superconducting behavior." Applicants discovered that ceramic materials are superconductors.

## CLAIM 422/379

CLAIM 422/379 recites:

CLAIM 379 A combination, comprising:

a mixed copper oxide composition including an alkaline earth element (AE) and a rare earth or element (RE) comprising a rare earth characteristic, said composition comprising a crystalline structure comprising a layered characteristic and multi-valent oxidation states, said composition exhibiting a substantially zero resistance to the flow of electrical current therethrough when cooled to a superconducting state at a temperature greater than or equal to 26°K, said mixed copper oxide having a superconducting onset temperature greater than or equal to 26°K, and

a current source for passing an electrical superconducting current through said composition when said composition exhibits substantially zero resistance at a temperature greater than or equal to 26°K and less than said onset temperature.

CLAIM 422 A combination according to anyone of claims 379 or 380, wherein said mixed copper oxide can be made by known principles of ceramic science.

**This claim should be allowed since claim 379 is allowed.**

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has



given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

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## CLAIM 422/380

CLAIM 422/380 recites:

CLAIM 379 A combination, comprising:

a mixed copper oxide composition including an alkaline earth element (AE) and a rare earth or element (RE) comprising a rare earth characteristic, said composition comprising a crystalline structure comprising a layered characteristic and multi-valent oxidation states, said composition exhibiting a substantially zero resistance to the flow of electrical current therethrough when cooled to a superconducting state at a temperature greater than or equal to 26°K, said mixed copper oxide having a superconducting onset temperature greater than or equal to 26°K, and

a current source for passing an electrical superconducting current through said composition when said composition exhibits substantially zero resistance at a temperature greater than or equal to 26°K and less than said onset temperature.

CLAIM 380 The combination of claim 379, wherein said crystalline structure comprises a perovskite characteristic.

CLAIM 422 A combination according to anyone of claims 379 or 380, wherein said mixed copper oxide can be made by known principles of ceramic science.

**This claim should be allowed since claim 380 is allowed.**

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

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## CLAIM 423

CLAIM 423 recites:

CLAIM 93 An apparatus, comprising:

a mixed copper oxide material exhibiting an onset of superconductivity at an onset temperature greater than or equal to 26°K, and

a current source for producing an electrical current through said copper oxide material while it is in a superconducting state at a temperature greater than or equal to 26°K.

CLAIM 382 The apparatus of claim 93, where said copper oxide material exhibits a crystalline structure comprising a layered characteristic.

CLAIM 423 A apparatus according to claim 382, wherein said copper oxide material can be made by known principles of ceramic science.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the

Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

The sentenced bridging page 1 and 2 of the specification states

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## CLAIM 424/383

CLAIM 424/383 recites:

CLAIM 383 A superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

- (a) a superconductor element made of a superconductive composition, the superconductive composition comprising a copper-oxide compound having a crystal structure comprising a perovskite characteristic and a layered characteristic, the composition having a superconductor transition temperature  $T_c$  of greater than or equal to 26°K;
- (b) means controller for maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature  $T_c$  of the superconductive composition; and
- (c) means for causing an electric current to flow in the superconductor element.

CLAIM 424 A superconductive apparatus according to anyone of claims 383, 384, 385, 386, 387 and 389, wherein said composition can be made by known principles of ceramic science.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner

has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

The sentenced bridging page 1 and 2 of the specification states

"Generally, superconductivity is considered to be a property of the metallic state of a material since all known superconductors are metallic under the conditions that cause them to be superconducting. A few normally non-metallic materials, for example, become superconducting under very high pressure wherein the pressure converts them to metals before they exhibit superconducting behavior." Applicants discovered that ceramic materials are superconductors.

## CLAIM 424/384

CLAIM 424/384 recites:

CLAIM 383 A superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

- (a) a superconductor element made of a superconductive composition, the superconductive composition comprising a copper-oxide compound having a crystal structure comprising a perovskite characteristic and a layered characteristic, the composition having a superconductor transition temperature  $T_c$  of greater than or equal to 26°K;
- (b) means controller for maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature  $T_c$  of the superconductive composition; and
- (c) means for causing an electric current to flow in the superconductor element.

CLAIM 384 The superconductive apparatus according to claim 383 in which the copper-oxide compound of the superconductive composition includes at least one rare-earth or element comprising a rare earth characteristic and at least one alkaline-earth element.

CLAIM 424 A superconductive apparatus according to anyone of claims 383, 384, 385, 386, 387 and 389, wherein



said composition can be made by known principles of ceramic science.

**This claim should be allowed since claim 384 is allowed.**

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

The sentenced bridging page 1 and 2 of the specification states  
"Generally, superconductivity is considered to be a property of the metallic state of a material since all known superconductors are metallic under the conditions that cause them to be superconducting. A few normally non-metallic materials, for example, become superconducting under very high pressure wherein the pressure converts them to metals before they exhibit superconducting behavior."  
Applicants discovered that ceramic materials are superconductors.

## CLAIM 424/385

CLAIM 424/385 recites:

CLAIM 383 A superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

- (a) a superconductor element made of a superconductive composition, the superconductive composition comprising a copper-oxide compound having a crystal structure comprising a perovskite characteristic and a layered characteristic, the composition having a superconductor transition temperature  $T_c$  of greater than or equal to 26°K;
- (b) means controller for maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature  $T_c$  of the superconductive composition; and
- (c) means for causing an electric current to flow in the superconductor element.

CLAIM 384 The superconductive apparatus according to claim 383 in which the copper-oxide compound of the superconductive composition includes at least one rare-earth or element comprising a rare earth characteristic and at least one alkaline-earth element.

CLAIM 385 The superconductive apparatus according to claim 384 in which the rare-earth or element comprising a rare earth characteristic is lanthanum.

CLAIM 424 A superconductive apparatus according to anyone of claims 383, 384, 385, 386, 387 and 389, wherein said composition can be made by known principles of ceramic science.

**This claim should be allowed since claim claim 385 is allowed.**

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

The sentenced bridging page 1 and 2 of the specification states

"Generally, superconductivity is considered to be a property of the metallic state of a material since all known superconductors are metallic under the conditions

that cause them to be superconducting. A few normally non-metallic materials, for example, become superconducting under very high pressure wherein the pressure converts them to metals before they exhibit superconducting behavior.” Applicants discovered that ceramic materials are superconductors.

## CLAIM 424/386

CLAIM 424/386 recites:

CLAIM 386 A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the copper-oxide compound including at least one rare-earth or element comprising a rare earth characteristic and at least one alkaline-earth element, the composition having a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature  $T_c$  and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature  $T_{q=0}$ , the transition-onset temperature  $T_c$  being greater than or equal to 26°K;

(b) a temperature controller for maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature  $T_{q=0}$  of the superconductive composition; and

(c) a current source for causing an electric current to flow in the superconductor element.

CLAIM 424 A superconductive apparatus according to anyone of claims 383, 384, 385, 386, 387 and 389, wherein said composition can be made by known principles of ceramic science.

**This claim should be allowed since claim 386 is allowed.**

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

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pressure converts them to metals before they exhibit superconducting behavior.”  
Applicants discovered that ceramic materials are superconductors.

## CLAIM 424/387

CLAIM 424/387 recites:

CLAIM 386 A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the copper-oxide compound including at least one rare-earth or element comprising a rare earth characteristic and at least one alkaline-earth element, the composition having a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature  $T_c$  and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature  $T_{q=0}$ , the transition-onset temperature  $T_c$  being greater than or equal to 26°K;

(b) a temperature controller for maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature  $T_{q=0}$  of the superconductive composition; and

(c) a current source for causing an electric current to flow in the superconductor element.



CLAIM 387 The superconductive apparatus according to claim 386 in which the rare-earth or an element comprising a rare earth characteristic is lanthanum.

CLAIM 424 A superconductive apparatus according to anyone of claims 383, 384, 385, 386, 387 and 389, wherein said composition can be made by known principles of ceramic science.

**This claim should be allowed since claim 387 is allowed.**

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

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that cause them to be superconducting. A few normally non-metallic materials, for example, become superconducting under very high pressure wherein the pressure converts them to metals before they exhibit superconducting behavior.” Applicants discovered that ceramic materials are superconductors.

## CLAIM 424/389

CLAIM 424/389 recites:

CLAIM 389 A superconductive apparatus for causing electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

- (a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the composition having a superconductor transition temperature  $T_c$  of greater than or equal to 26°K;
- (b) a temperature controller maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature  $T_c$  of the superconductive composition; and
- (c) causing an electric current to flow in the superconductor element.

CLAIM 424 A superconductive apparatus according to anyone of claims 383, 384, 385, 386, 387 and 389, wherein said composition can be made by known principles of ceramic science.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has

given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

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## CLAIM 425

CLAIM 425 recites:

CLAIM 388 An apparatus comprising:

a composition including a transition metal, a rare earth or an element comprising a rare earth characteristic, an alkaline earth element, and oxygen, where said composition is a mixed transition metal oxide having a non-stoichiometric amount of oxygen therein and exhibiting a superconducting state at a temperature greater than or equal to 26°K,

a temperature controller maintaining said composition in said superconducting state at a temperature greater than or equal to 26°K, and

a current source passing an electrical current through said composition while said composition is in said superconducting state.

CLAIM 425 A apparatus according to claim 388, wherein said composition can be made according to known principles of ceramic science.

**This claim should be allowed since claim 388 is allowed.**

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on

Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

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## CLAIM 426/389

CLAIM 426/389 recites:

CLAIM 389 A superconductive apparatus for causing electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the composition having a superconductor transition temperature  $T_c$  of greater than or equal to 26°K;

(b) a temperature controller maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature  $T_c$  of the superconductive composition; and

(c) causing an electric current to flow in the superconductor element.

CLAIM 426 A superconductive apparatus according to anyone of claims 389 to 400 or 401, wherein said superconductive composition can be made by known principles of ceramic science.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has

given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

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## CLAIM 426/389

CLAIM 426/389 recites:

CLAIM 389 A superconductive apparatus for causing electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the composition having a superconductor transition temperature  $T_c$  of greater than or equal to 26°K;

(b) a temperature controller maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature  $T_c$  of the superconductive composition; and

(c) causing an electric current to flow in the superconductor element.

CLAIM 390 The superconductive apparatus according to claim 389 in which the copper-oxide compound of the superconductive composition includes at least one rare-earth or an element comprising a rare earth characteristic and at least one alkaline-earth element.

CLAIM 426 A superconductive apparatus according to anyone of claims 389 to 400 or 401, wherein said

superconductive composition can be made by known principles of ceramic science.

**This claim should be allowed since claim 390 is allowed.**

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

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## CLAIM 426/391

CLAIM 426/391 recites:

CLAIM 389 A superconductive apparatus for causing electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

- (a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the composition having a superconductor transition temperature  $T_c$  of greater than or equal to 26°K;
- (b) a temperature controller maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature  $T_c$  of the superconductive composition; and
- (c) causing an electric current to flow in the superconductor element.

CLAIM 390 The superconductive apparatus according to claim 389 in which the copper-oxide compound of the superconductive composition includes at least one rare-earth or an element comprising a rare earth characteristic and at least one alkaline-earth element.

CLAIM 391 The superconductive apparatus according to claim 390 in which the rare-earth or an element comprising a rare earth characteristic is lanthanum.

CLAIM 426 A superconductive apparatus according to anyone of claims 389 to 400 or 401, wherein said superconductive composition can be made by known principles of ceramic science.

**This claim should be allowed since claim 391 is allowed.**

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

The sentenced bridging page 1 and 2 of the specification states

"Generally, superconductivity is considered to be a property of the metallic state of a material since all known superconductors are metallic under the conditions that

cause them to be superconducting. A few normally non-metallic materials, for example, become superconducting under very high pressure wherein the pressure converts them to metals before they exhibit superconducting behavior.” Applicants discovered that ceramic materials are superconductors.

## CLAIM 426/392

CLAIM 426/392 recites:

CLAIM 392 A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the copper-oxide compound including at least one rare-earth or rare-earth-like element and at least one alkaline-earth element, the composition having a superconductive/resistive-transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature  $T_c$  and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature  $T_p=0$ , the transition-onset temperature  $T_c$  being greater than or equal to 26°K;

(b) a temperature controller maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature  $T_p=0$  of the superconductive composition; and

(c) a current source causing an electric current to flow in the superconductor element.

CLAIM 426 A superconductive apparatus according to anyone of claims 389 to 400 or 401, wherein said superconductive composition can be made by known principles of ceramic science.

**This claim should be allowed since claim 392 is allowed.**

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

The sentenced bridging page 1 and 2 of the specification states  
"Generally, superconductivity is considered to be a property of the metallic state of a material since all known superconductors are metallic under the conditions that cause them to be superconducting. A few normally non-metallic materials, for example, become superconducting under very high pressure wherein the pressure converts them to metals before they exhibit superconducting behavior." Applicants discovered that ceramic materials are superconductors.

## CLAIM 426/393

CLAIM 426/393 recites:

CLAIM 392 A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the copper-oxide compound including at least one rare-earth or rare-earth-like element and at least one alkaline-earth element, the composition having a superconductive/resistive-transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature  $T_c$  and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature  $T_p=0$ , the transition-onset temperature  $T_c$  being greater than or equal to 26°K;

(b) a temperature controller maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature  $T_p=0$  of the superconductive composition; and

(c) a current source causing an electric current to flow in the superconductor element.



CLAIM 393 The superconductive apparatus according to claim 392 in which the rare-earth or an element comprising a rare earth characteristic is lanthanum.

CLAIM 426 A superconductive apparatus according to anyone of claims 389 to 400 or 401, wherein said superconductive composition can be made by known principles of ceramic science.

**This claim should be allowed since claim 393 is allowed.**

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

The sentenced bridging page 1 and 2 of the specification states

"Generally, superconductivity is considered to be a property of the metallic state of a material since all known superconductors are metallic under the conditions that

cause them to be superconducting. A few normally non-metallic materials, for example, become superconducting under very high pressure wherein the pressure converts them to metals before they exhibit superconducting behavior.” Applicants discovered that ceramic materials are superconductors.

## CLAIM 426/394

CLAIM 426/394 recites:

CLAIM 394 An apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the composition having a superconductive transition temperature  $T_c$  of greater than or equal to 26°K, said superconductive composition includes at least one element selected from the group consisting of a Group II A element, a rare earth element; and a Group III B element;

(b) a temperature controller maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature  $T_c$  of the superconductive composition; and

(c) a current source causing an electric current to flow in the superconductor element.

CLAIM 426 A superconductive apparatus according to anyone of claims 389 to 400 or 401, wherein said superconductive composition can be made by known principles of ceramic science.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

The sentenced bridging page 1 and 2 of the specification states

"Generally, superconductivity is considered to be a property of the metallic state of a material since all known superconductors are metallic under the conditions that cause them to be superconducting. A few normally non-metallic materials, for example, become superconducting under very high pressure wherein the pressure converts them to metals before they exhibit superconducting behavior." Applicants discovered that ceramic materials are superconductors.

## CLAIM 426/395

CLAIM 426/395 recites:

CLAIM 395 An apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the copper-oxide compound including at least one element selected from the group consisting of a Group II A element, a rare earth element and a Group III B element, the composition having a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature  $T_c$  and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature  $T_{p=0}$ , the transition-onset temperature  $T_c$  being greater than or equal to 26°K;

(b) a temperature controller maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature  $T_{p=0}$  of the superconductive composition; and

(c) a current source causing an electric current to flow in the superconductor element.

CLAIM 426 A superconductive apparatus according to anyone of claims 389 to 400 or 401, wherein said superconductive composition can be made by known principles of ceramic science.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

The sentenced bridging page 1 and 2 of the specification states "Generally, superconductivity is considered to be a property of the metallic state of a material since all known superconductors are metallic under the conditions that cause them to be superconducting. A few normally non-metallic materials, for example, become superconducting under very high pressure wherein the pressure converts them to metals before they exhibit superconducting behavior." Applicants discovered that ceramic materials are superconductors.

## CLAIM 426/396

CLAIM 426/396 recites:

CLAIM 396 A superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the composition having a superconductive transition temperature  $T_c$  of greater than or equal to 26°K, said superconductive composition includes at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element;

(b) a temperature controller maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature  $T_c$  of the superconductive composition; and

(c) a current source causing an electric current to flow in the superconductor element.

CLAIM 426 A superconductive apparatus according to anyone of claims 389 to 400 or 401, wherein said

superconductive composition can be made by known principles of ceramic science.

**This claim should be allowed since claim 396 is allowed.**

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

The sentenced bridging page 1 and 2 of the specification states

"Generally, superconductivity is considered to be a property of the metallic state of a material since all known superconductors are metallic under the conditions that cause them to be superconducting. A few normally non-metallic materials, for example, become superconducting under very high pressure wherein the pressure converts them to metals before they exhibit superconducting behavior." Applicants discovered that ceramic materials are superconductors.



## CLAIM 426/397

CLAIM 426/397 recites:

CLAIM 397 A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the copper-oxide compound including at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element, the composition having a superconductive/resistive transition defining a superconductive-resistive-transition temperature range between an upper limit defined by a transition-onset temperature  $T_c$  and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature  $T_{p=0}$ , the transition-onset temperature  $T_c$  being greater than or equal to 26°K;

(b) a temperature controller maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature  $T_{p=0}$  of the superconductive composition; and

(c) a current source causing an electric current to flow in the superconductor element.

CLAIM 426 A superconductive apparatus according to anyone of claims 389 to 400 or 401, wherein said superconductive composition can be made by known principles of ceramic science.

**This claim should be allowed since claim 397 is allowed.**

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

The sentenced bridging page 1 and 2 of the specification states

"Generally, superconductivity is considered to be a property of the metallic state of a material since all known superconductors are metallic under the conditions that cause them to be superconducting. A few normally non-metallic materials, for

example, become superconducting under very high pressure wherein the pressure converts them to metals before they exhibit superconducting behavior.” Applicants discovered that ceramic materials are superconductors.

## CLAIM 426/398

CLAIM 426/398 recites:

CLAIM 398 A superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a transition metal oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the composition having a superconductive transition temperature  $T_c$  of greater than or equal to 26°K, said superconductive composition includes an element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element;

(b) a temperature controller maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition  $T_c$  of the superconductive composition; and

(c) a current source causing an electric current to flow in the superconductor element.

CLAIM 426 A superconductive apparatus according to anyone of claims 389 to 400 or 401, wherein said

superconductive composition can be made by known principles of ceramic science.

**This claim should be allowed since claim 398 is allowed.**

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

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## CLAIM 426/399

CLAIM 426/399 recites:

CLAIM 399 A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a transition metal-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the transition metal-oxide compound including at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element, the composition having a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature  $T_c$  and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature  $T_p=0$ , the transition-onset temperature  $T_c$  being greater than or equal to 26°K;

(b) a temperature controller maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature  $T_p=0$  of the superconductive composition; and

(c) a current source causing an electric current to flow in the superconductor element.

CLAIM 426 A superconductive apparatus according to anyone of claims 389 to 400 or 401, wherein said superconductive composition can be made by known principles of ceramic science.

**This claim should be allowed since claims 399 is allowed.**

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

The sentenced bridging page 1 and 2 of the specification states

"Generally, superconductivity is considered to be a property of the metallic state of a material since all known superconductors are metallic under the conditions that

cause them to be superconducting. A few normally non-metallic materials, for example, become superconducting under very high pressure wherein the pressure converts them to metals before they exhibit superconducting behavior.” Applicants discovered that ceramic materials are superconductors.



## CLAIM 426/400

CLAIM 426/400 recites:

CLAIM 400 A superconductive apparatus for causing electric-current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the composition having a superconductive transition temperature  $T_c$  of greater than or equal to 26°K, said superconductive composition includes a Group II A element, and at least one element selected from the group consisting of a rare earth element and a Group III B element;

(b) a temperature controller maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature  $T_c$  of the superconductive composition; and

(c) a current source causing an electric current to flow in the superconductor element.

CLAIM 426 A superconductive apparatus according to anyone of claims 389 to 400 or 401, wherein said superconductive composition can be made by known principles of ceramic science.

**This claim should be allowed since claims 400 is allowed.**

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

The sentenced bridging page 1 and 2 of the specification states

"Generally, superconductivity is considered to be a property of the metallic state of a material since all known superconductors are metallic under the conditions that cause them to be superconducting. A few normally non-metallic materials, for example, become superconducting under very high pressure wherein the pressure converts them to metals before they exhibit superconducting behavior." Applicants discovered that ceramic materials are superconductors.

## CLAIM 426/401

CLAIM 426/401 recites:

CLAIM 401 A superconductive apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the copper-oxide compound including Group II A element, and at least one element selected from the group consisting of a rare earth element and a Group III B element, the composition having a superconductive-resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature  $T_c$  and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature  $T_p=0$ , the transition-onset temperature  $T_c$  being greater than or equal to 26°K;

(b) a temperature controller maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature  $T_p=0$  of the superconductive composition; and

(c) a current source causing an electric current to flow in the superconductor element.

CLAIM 426 A superconductive apparatus according to anyone of claims 389 to 400 or 401, wherein said superconductive composition can be made by known principles of ceramic science.

**This claim should be allowed since claims 401 is allowed.**

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

The sentenced bridging page 1 and 2 of the specification states  
"Generally, superconductivity is considered to be a property of the metallic state of a material since all known superconductors are metallic under the conditions that cause them to be superconducting. A few normally non-metallic materials, for example, become superconducting under very high pressure wherein the pressure converts them to metals before they exhibit superconducting behavior." Applicants discovered that ceramic materials are superconductors.

## CLAIM 427/412

CLAIM 427/412 recites:

CLAIM 412 An apparatus for conducting an electric current essentially without resistive losses, comprising:

- (a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a transition metal-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the transition metal-oxide compound including at least one element selected from the group consisting of a Group II A element and at least one element selected from the group consisting of a rare earth element and a Group III B element, the composition comprising a superconductive/resistive transition defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature  $T_c$  and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature  $T_p=0$ , the transition-onset temperature  $T_c$  being greater than or equal to 26°K;
- (b) a temperature controller for maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature  $T_p=0$  of the superconductive composition; and
- (c) a source of an electric current to flow in the superconductor element.

CLAIM 427 A apparatus according to anyone of claims 402 to 412 or 413, wherein said superconductive composition can be made by known principles of ceramic science.

**This claim should be allowed since claims 412 is allowed.**

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

The sentenced bridging page 1 and 2 of the specification states  
"Generally, superconductivity is considered to be a property of the metallic state of a material since all known superconductors are metallic under the conditions that cause them to be superconducting. A few normally non-metallic materials, for example, become superconducting under very high pressure wherein the pressure converts them to metals before they exhibit superconducting behavior." Applicants discovered that ceramic materials are superconductors.

## CLAIM 427/413

CLAIM 427/413 recites:

CLAIM 413 An apparatus for conducting an electric current essentially without resistive losses, comprising:

(a) a superconductor element made of a superconductive composition, the superconductive composition consisting essentially of a copper-oxide compound comprising a crystal structure comprising a layered characteristic and a perovskite characteristic, the copper-oxide compound including at least one element selected from the group consisting of a group II A element, at least one element selected from the group consisting of a rare earth element and at least one element selected from the group consisting of a Group III B element, the composition comprising a superconductive-resistive transition temperature defining a superconductive/resistive-transition temperature range between an upper limit defined by a transition-onset temperature  $T_c$  and a lower limit defined by an effectively-zero-bulk-resistivity intercept temperature  $T_p=0$ , the transition-onset temperature  $T_c$  being greater than or equal to 26°K;

(b) a temperature controller for maintaining the superconductor element at a temperature below the effectively-zero-bulk-resistivity intercept temperature  $T_p=0$  of the superconductive composition; and

(c) a source of an electric current to flow in the superconductor element.

CLAIM 427 A apparatus according to anyone of claims 402 to 412 or 413, wherein said superconductive composition can be made by known principles of ceramic science.

**This claim should be allowed since claims 413 is allowed.**

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

The sentenced bridging page 1 and 2 of the specification states  
"Generally, superconductivity is considered to be a property of the metallic state of a material since all known superconductors are metallic under the conditions that cause them to be superconducting. A few normally non-metallic materials, for example, become superconducting under very high pressure wherein the pressure



converts them to metals before they exhibit superconducting behavior.” Applicants discovered that ceramic materials are superconductors.

## CLAIM 428

CLAIM 428 recites:

CLAIM 428 An apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

a superconductive element comprising a superconductive composition, said superconductive composition comprising O and at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu; and

said composition comprising a superconductor transition temperature  $T_c$  of greater than or equal to 26°K.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in

view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 429

CLAIM 429 recites:

CLAIM 428 An apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

a superconductive element comprising a superconductive composition, said superconductive composition comprising O and at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu; and

said composition comprising a superconductor transition temperature  $T_c$  of greater than or equal to 26°K.

CLAIM 429 An apparatus according to claim 428, further including:

a temperature controller for maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature  $T_c$  of the superconductive composition; and

a source of an electric current to flow in the superconductor element.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner

has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 430

CLAIM 430 recites:

CLAIM 428 An apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

a superconductive element comprising a superconductive composition, said superconductive composition comprising O and at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu; and

said composition comprising a superconductor transition temperature  $T_c$  of greater than or equal to 26°K.

CLAIM 430 An apparatus according to claim 428, wherein said composition comprises a substantially layered structure.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement

Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, News and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 431

CLAIM recites:

CLAIM 428 An apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

a superconductive element comprising a superconductive composition, said superconductive composition comprising O and at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu; and

said composition comprising a superconductor transition temperature  $T_c$  of greater than or equal to 26°K.

CLAIM 429 An apparatus according to claim 428, further including:

a temperature controller for maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature  $T_c$  of the superconductive composition; and

a source of an electric current to flow in the superconductor element.

CLAIM 431 An apparatus according to claim 429, wherein said composition comprises a substantially layered structure.



The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 432/428

CLAIM 432/428 recites:

CLAIM 428 An apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

a superconductive element comprising a superconductive composition, said superconductive composition comprising O and at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu; and

said composition comprising a superconductor transition temperature  $T_c$  of greater than or equal to 26°K.

CLAIM 432 An apparatus according to anyone of claims 428 to 430 or 431, wherein said composition comprises a substantially perovskite crystal structure.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement

Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 432/429

CLAIM 432/429 recites:

CLAIM 428 An apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

a superconductive element comprising a superconductive composition, said superconductive composition comprising O and at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu; and

said composition comprising a superconductor transition temperature  $T_c$  of greater than or equal to 26°K.

CLAIM 429 An apparatus according to claim 428, further including:

a temperature controller for maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature  $T_c$  of the superconductive composition; and

a source of an electric current to flow in the superconductor element.

CLAIM 432 An apparatus according to anyone of claims 428 to 430 or 431, wherein said composition comprises a substantially perovskite crystal structure.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 432/430

CLAIM 432/430 recites:

CLAIM 428 An apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

a superconductive element comprising a superconductive composition, said superconductive composition comprising O and at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu; and

said composition comprising a superconductor transition temperature  $T_c$  of greater than or equal to 26°K.

CLAIM 430 An apparatus according to claim 428, wherein said composition comprises a substantially layered structure.

CLAIM 432 An apparatus according to anyone of claims 428 to 430 or 431, wherein said composition comprises a substantially perovskite crystal structure.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that

persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 432/431

CLAIM 432/431 recites:

CLAIM 428 An apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

a superconductive element comprising a superconductive composition, said superconductive composition comprising O and at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu; and

said composition comprising a superconductor transition temperature  $T_c$  of greater than or equal to 26°K.

CLAIM 429 An apparatus according to claim 428, further including:

a temperature controller for maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature  $T_c$  of the superconductive composition; and

a source of an electric current to flow in the superconductor element.

CLAIM 431 An apparatus according to claim 429, wherein said composition comprises a substantially layered structure.



CLAIM 432 An apparatus according to anyone of claims 428 to 430 or 431, wherein said composition comprises a substantially perovskite crystal structure.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 433/428

CLAIM 433/428 recites:

CLAIM 428 An apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

a superconductive element comprising a superconductive composition, said superconductive composition comprising O and at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu; and

said composition comprising a superconductor transition temperature  $T_c$  of greater than or equal to 26°K.

CLAIM 433 An apparatus according to any one of claims 428 to 430 or 431, wherein said composition comprises a perovskite-like structure.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the

Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 433/429

CLAIM 433/429 recites:

CLAIM 428 An apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

a superconductive element comprising a superconductive composition, said superconductive composition comprising O and at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu; and

said composition comprising a superconductor transition temperature  $T_c$  of greater than or equal to 26°K.

CLAIM 429 An apparatus according to claim 428, further including:

a temperature controller for maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature  $T_c$  of the superconductive composition; and

a source of an electric current to flow in the superconductor element.

CLAIM 433 An apparatus according to any one of claims 428 to 430 or 431, wherein said composition comprises a perovskite-like structure.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 433/430

CLAIM 433/430 recites:

CLAIM 428 An apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

a superconductive element comprising a superconductive composition, said superconductive composition comprising O and at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu; and

said composition comprising a superconductor transition temperature  $T_c$  of greater than or equal to 26°K.

CLAIM 430 An apparatus according to claim 428, wherein said composition comprises a substantially layered structure.

CLAIM 433 An apparatus according to any one of claims 428 to 430 or 431, wherein said composition comprises a perovskite-like structure.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that

persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 433/431

CLAIM 433/431 recites:

CLAIM 428 An apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

a superconductive element comprising a superconductive composition, said superconductive composition comprising O and at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu; and

said composition comprising a superconductor transition temperature  $T_c$  of greater than or equal to 26°K.

CLAIM 429 An apparatus according to claim 428, further including:

a temperature controller for maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature  $T_c$  of the superconductive composition; and

a source of an electric current to flow in the superconductor element.

CLAIM 431 An apparatus according to claim 429, wherein said composition comprises a substantially layered structure.



CLAIM 433 An apparatus according to any one of claims 428 to 430 or 431, wherein said composition comprises a perovskite-like structure.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 434/428

CLAIM 434/428 recites:

CLAIM 428 An apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

a superconductive element comprising a superconductive composition, said superconductive composition comprising O and at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu; and

said composition comprising a superconductor transition temperature  $T_c$  of greater than or equal to 26°K.

CLAIM 434 An apparatus according to any one of claims 428 to 430 or 431, wherein said composition comprises a perovskite characteristic.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole

1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 434/429

CLAIM 434/429 recites:

CLAIM 428 An apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

a superconductive element comprising a superconductive composition, said superconductive composition comprising O and at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu; and

said composition comprising a superconductor transition temperature  $T_c$  of greater than or equal to 26°K.

CLAIM 429 An apparatus according to claim 428, further including:

a temperature controller for maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature  $T_c$  of the superconductive composition; and

a source of an electric current to flow in the superconductor element.

CLAIM 434 An apparatus according to any one of claims 428 to 430 or 431, wherein said composition comprises a perovskite characteristic.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 434/430

CLAIM 434/430 recites:

CLAIM 428 An apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

a superconductive element comprising a superconductive composition, said superconductive composition comprising O and at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu; and

said composition comprising a superconductor transition temperature  $T_c$  of greater than or equal to 26°K.

CLAIM 430 An apparatus according to claim 428, wherein said composition comprises a substantially layered structure.

CLAIM 434 An apparatus according to any one of claims 428 to 430 or 431, wherein said composition comprises a perovskite characteristic.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that

persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 434/431

CLAIM 434/431 recites:

CLAIM 428 An apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

a superconductive element comprising a superconductive composition, said superconductive composition comprising O and at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu; and

said composition comprising a superconductor transition temperature  $T_c$  of greater than or equal to 26°K.

CLAIM 429 An apparatus according to claim 428, further including:

a temperature controller for maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature  $T_c$  of the superconductive composition; and

a source of an electric current to flow in the superconductor element.

CLAIM 431 An apparatus according to claim 429, wherein said composition comprises a substantially layered structure.



CLAIM 434 An apparatus according to any one of claims 428 to 430 or 431, wherein said composition comprises a perovskite characteristic.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 435/428

CLAIM 435/428 recites:

CLAIM 428 An apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

a superconductive element comprising a superconductive composition, said superconductive composition comprising O and at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu; and

said composition comprising a superconductor transition temperature  $T_c$  of greater than or equal to 26°K.

CLAIM 435 An apparatus according to any one of claims 428 to 430 or 431, wherein said composition comprises a perovskite related structure.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole

1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 435/429

CLAIM 435/428 recites:

CLAIM 428 An apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

a superconductive element comprising a superconductive composition, said superconductive composition comprising O and at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu; and

said composition comprising a superconductor transition temperature  $T_c$  of greater than or equal to 26°K.

CLAIM 429 An apparatus according to claim 428, further including:

a temperature controller for maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature  $T_c$  of the superconductive composition; and

a source of an electric current to flow in the superconductor element.

CLAIM 435 An apparatus according to any one of claims 428 to 430 or 431, wherein said composition comprises a perovskite related structure.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 435/430

CLAIM 435/430 recites:

CLAIM 428 An apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

a superconductive element comprising a superconductive composition, said superconductive composition comprising O and at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu; and

said composition comprising a superconductor transition temperature  $T_c$  of greater than or equal to 26°K.

CLAIM 430 An apparatus according to claim 428, wherein said composition comprises a substantially layered structure.

CLAIM 435 An apparatus according to any one of claims 428 to 430 or 431, wherein said composition comprises a perovskite related structure.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim

without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 435/431

CLAIM 435/431 recites:

CLAIM 428 An apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

a superconductive element comprising a superconductive composition, said superconductive composition comprising O and at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu; and

said composition comprising a superconductor transition temperature  $T_c$  of greater than or equal to 26°K.

CLAIM 429 An apparatus according to claim 428, further including:

a temperature controller for maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature  $T_c$  of the superconductive composition; and

a source of an electric current to flow in the superconductor element.

CLAIM 431 An apparatus according to claim 429, wherein said composition comprises a substantially layered structure.



CLAIM 435 An apparatus according to any one of claims 428 to 430 or 431, wherein said composition comprises a perovskite related structure.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 436/431

CLAIM 436/431 recites:

CLAIM 428 An apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

a superconductive element comprising a superconductive composition, said superconductive composition comprising O and at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu; and

said composition comprising a superconductor transition temperature  $T_c$  of greater than or equal to 26°K.

CLAIM 429 An apparatus according to claim 428, further including:

a temperature controller for maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature  $T_c$  of the superconductive composition; and

a source of an electric current to flow in the superconductor element.

CLAIM 431 An apparatus according to claim 429, wherein said composition comprises a substantially layered structure.

CLAIM 436 An apparatus according to anyone of claims 428 to 431 or 432, wherein said composition can be made according to known principals of ceramic science.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

The sentenced bridging page 1 and 2 of the specification states  
"Generally, superconductivity is considered to be a property of the metallic state of a material since all known superconductors are metallic under the conditions that cause them to be superconducting. A few normally non-metallic materials, for example, become superconducting under very high pressure wherein the pressure converts them to metals before they exhibit superconducting behavior." Applicants discovered that ceramic materials are superconductors.

converts them to metals before they exhibit superconducting behavior.” Applicants discovered that ceramic materials are superconductors.

### CLAIM 436/432/430/428

CLAIM 436/432/430/428 recites:

CLAIM 428 An apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

a superconductive element comprising a superconductive composition, said superconductive composition comprising O and at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu; and

said composition comprising a superconductor transition temperature  $T_c$  of greater than or equal to 26°K.

CLAIM 430 An apparatus according to claim 428, wherein said composition comprises a substantially layered structure.

CLAIM 432 An apparatus according to anyone of claims 428 to 430 or 431, wherein said composition comprises a substantially perovskite crystal structure.

CLAIM 436 An apparatus according to anyone of claims 428 to 431 or 432, wherein said composition can be made according to known principals of ceramic science.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has

given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

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"Generally, superconductivity is considered to be a property of the metallic state of a material since all known superconductors are metallic under the conditions that cause them to be superconducting. A few normally non-metallic materials, for example, become superconducting under very high pressure wherein the pressure converts them to metals before they exhibit superconducting behavior." Applicants discovered that ceramic materials are superconductors.

**CLAIM 436/432/431/429/428**

CLAIM 436/432/431./429/428 recites:

CLAIM 428 An apparatus capable of carrying electric current flow in a superconductive state at a temperature greater than or equal to 26°K, comprising:

a superconductive element comprising a superconductive composition, said superconductive composition comprising O and at least one element selected from the group consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu; and

said composition comprising a superconductor transition temperature  $T_c$  of greater than or equal to 26°K.

CLAIM 429 An apparatus according to claim 428, further including:

a temperature controller for maintaining the superconductor element at a temperature greater than or equal to 26°K and below the superconductor transition temperature  $T_c$  of the superconductive composition; and

a source of an electric current to flow in the superconductor element.

CLAIM 431 An apparatus according to claim 429, wherein said composition comprises a substantially layered structure.

CLAIM 432 An apparatus according to anyone of claims 428 to 430 or 431, wherein said composition comprises a substantially perovskite crystal structure.

CLAIM 436 An apparatus according to anyone of claims 428 to 431 or 432, wherein said composition can be made according to known principals of ceramic science.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

The sentenced bridging page 1 and 2 of the specification states

"Generally, superconductivity is considered to be a property of the metallic state of a material since all known superconductors are metallic under the conditions that cause them to be superconducting. A few normally non-metallic materials, for example, become superconducting under very high pressure wherein the pressure



converts them to metals before they exhibit superconducting behavior.” Applicants discovered that ceramic materials are superconductors.

## CLAIM 437

CLAIM 437 recites:

CLAIM 88 An apparatus comprising:

a composition exhibiting a superconductive state at a temperature greater than or equal to 26°K,

a cooler for cooling said composition to a temperature greater than or equal to 26°K at which temperature said composition exhibits said superconductive state, and

a current source for passing an electrical current through said composition while said composition is in said superconductive state.

CLAIM 437 An apparatus according to claim 88 wherein said composition is an oxide.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement

Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, News and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 438

CLAIM 438 recites:

CLAIM 438 An apparatus comprising: a means for conducting a superconducting current at a temperature greater than or equal to 26°K and a current source for providing an electric current to flow in said means for conducting a superconducting current.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

This claim is in means plus function form and under *In re Donaldson* 29 USPQ 2d1845 (Fed. Cir. 1994) should be allowed since the Examiner has allowed claims to the specific examples described in Applicants' specification which

corresponds to all of the allowed claims. The Examiner provides no reason for not following In re Donaldson.

### CLAIM 439

CLAIM 439 recites:

CLAIM 438 An apparatus comprising: a means for conducting a superconducting current at a temperature greater than or equal to 26°K and a current source for providing an electric current to flow in said means for conducting a superconducting current.

CLAIM 439 An apparatus according to claim 438, wherein said means for conducting a superconductive current comprises a Tc greater than or equal to 26°K.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 440

CLAIM 440 recites:

CLAIM 438 An apparatus comprising: a means for conducting a superconducting current at a temperature greater than or equal to 26°K and a current source for providing an electric current to flow in said means for conducting a superconducting current.

CLAIM 440 An apparatus according to claim 438, further including a temperature controller for maintaining said means for conducting a superconducting current at a said temperature.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

This claim is in means plus function form and under *In re Donaldson* 29 USPQ 2d1845 (Fed. Cir. 1994) should be allowed since the Examiner has allowed claims to the specific examples described in Applicants' specification which corresponds to all of the allowed claims. The Examiner provides no reason for not following *In re Donaldson*.



## CLAIM 441/438

CLAIM 441/438 recites:

CLAIM 438 An apparatus comprising: a means for conducting a superconducting current at a temperature greater than or equal to 26°K and a current source for providing an electric current to flow in said means for conducting a superconducting current.

CLAIM 441 An apparatus according to anyone of claims 438, 439 or 440, wherein said means for conducting a superconducting current comprises oxygen.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 441/439

CLAIM 441/439 recites:

CLAIM 438 An apparatus comprising: a means for conducting a superconducting current at a temperature greater than or equal to 26°K and a current source for providing an electric current to flow in said means for conducting a superconducting current.

CLAIM 439 An apparatus according to claim 438, wherein said means for conducting a superconductive current comprises a Tc greater than or equal to 26°K.

CLAIM 441 An apparatus according to anyone of claims 438, 439 or 440, wherein said means for conducting a superconducting current comprises oxygen.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner

has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 441/440

CLAIM 441/440 recites:

CLAIM 438 An apparatus comprising: a means for conducting a superconducting current at a temperature greater than or equal to 26°K and a current source for providing an electric current to flow in said means for conducting a superconducting current.

CLAIM 440 An apparatus according to claim 438, further including a temperature controller for maintaining said means for conducting a superconducting current at a said temperature.

CLAIM 441 An apparatus according to anyone of claims 438, 439 or 440, wherein said means for conducting a superconducting current comprises oxygen.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe,

Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 442/438

CLAIM 442/438 recites:

CLAIM 438 An apparatus comprising: a means for conducting a superconducting current at a temperature greater than or equal to 26°K and a current source for providing an electric current to flow in said means for conducting a superconducting current.

CLAIM 442 An apparatus according to anyone of claims 438, 439 and 440, wherein said means for conducting a superconducting current comprises one or more of the groups consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in

view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 442/439

CLAIM 442/439 recites:

CLAIM 438 An apparatus comprising: a means for conducting a superconducting current at a temperature greater than or equal to 26°K and a current source for providing an electric current to flow in said means for conducting a superconducting current.

CLAIM 439 An apparatus according to claim 438, wherein said means for conducting a superconductive current comprises a Tc greater than or equal to 26°K.

CLAIM 442 An apparatus according to anyone of claims 438, 439 and 440, wherein said means for conducting a superconducting current comprises one or more of the groups consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement



Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, News and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.

## CLAIM 442/440

CLAIM 442/440 recites:

CLAIM 438 An apparatus comprising: a means for conducting a superconducting current at a temperature greater than or equal to 26°K and a current source for providing an electric current to flow in said means for conducting a superconducting current.

CLAIM 440 An apparatus according to claim 438, further including a temperature controller for maintaining said means for conducting a superconducting current at a said temperature.

CLAIM 442 An apparatus according to anyone of claims 438, 439 and 440, wherein said means for conducting a superconducting current comprises one or more of the groups consisting of Be, Mg, Ca, Sr, Ba, Ra, Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole

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## CLAIM 443/438

CLAIM 443/438 recites:

CLAIM 438 An apparatus comprising: a means for conducting a superconducting current at a temperature greater than or equal to 26°K and a current source for providing an electric current to flow in said means for conducting a superconducting current.

CLAIM 443 An apparatus according to anyone of claims 438, 439 or 440, wherein said means for conducting a superconducting current comprises one or more of Be, Mg, Ca, Sr, Ba and Ra and one or more of Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in

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CLAIM 438 An apparatus comprising: a means for conducting a superconducting current at a temperature greater than or equal to 26°K and a current source for providing an electric current to flow in said means for conducting a superconducting current.

CLAIM 439 An apparatus according to claim 438, wherein said means for conducting a superconductive current comprises a Tc greater than or equal to 26°K.

CLAIM 443 An apparatus according to anyone of claims 438, 439 or 440, wherein said means for conducting a superconducting current comprises one or more of Be, Mg, Ca, Sr, Ba and Ra and one or more of Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole 1988, 1995 and 1996 Enablement Statements, the Schuller Enablement

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## CLAIM 443/440

CLAIM 443/440 recites:

CLAIM 438 An apparatus comprising: a means for conducting a superconducting current at a temperature greater than or equal to 26°K and a current source for providing an electric current to flow in said means for conducting a superconducting current.

CLAIM 440 An apparatus according to claim 438, further including a temperature controller for maintaining said means for conducting a superconducting current at a said temperature.

CLAIM 443 An apparatus according to anyone of claims 438, 439 or 440, wherein said means for conducting a superconducting current comprises one or more of Be, Mg, Ca, Sr, Ba and Ra and one or more of Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

The Examiner has not made as to this claim a prima facie case of lack of enablement for the reasons given in all volumes of this Brief. The Examiner has given no specific reasons for rejecting this claim as not enabled. The Examiner has not shown why a person of ordinary skill in the art cannot, based on Applicants' teaching, determine without undue experimentation, species that come within the scope of this claim other than those that the Examiner has expressly stated are enabled. Applicants have shown extensive evidence that persons of skill in the art can determine species within the scope of this claim without undue experimentation. Examples of Applicants' evidence are: the Examiner's First, Second, Third and Fourth Enablement Statements, the Poole



1988, 1995 and 1996 Enablement Statements, the Schuller Enablement Statement and Applicants' Affidavits of Mitzi, Dinger, Tsuei, Shaw, Duncombe, Newns and Bednorz in Brief Attachments AH to AR. In particular the Examiner has given no reason for why this claim is not enabled by Applicants' teaching in view of the underlined limitation of the claim which includes specific limitations on the scope of this claim.